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ABSTRACT

This followup study, one of a series of documents assessing the University of Western Ontario Preschool Project, examines the long range effects of the Project on the performance of children from low income families after entering the public schools. This study summarizes data accumulated by the end of the academic year 1977-78 and describes subject performance at three grade levels (Kindergarten, Grade 1 and Grade 2). Two groups of preschool program graduates (one group including children who had started preschool as 3-year-olds, another including children who had started preschool as 4-year-olds) were compared with a group of control children who had begun kindergarten as 5-year-olds without prior preschool or group care experience. Measures were used to assess social adjustment as well as cognitive competence, intellectual ability and academic achievement. The results so far indicate that preschool graduates have maintained their preschool IQ and other gains; their academic achievements have been generally satisfactory and have been superior to those of the controls; all of the preschool graduates have been promoted each year, but several of the controls have repeated a grade. In general, children who started preschool as 3-year-olds appear to have made greater initial cognitive gains than children in the other groups, and have so far maintained these gains. (Author/SE)

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FOLLOW-UP STUDY OF CHILDREN IN THE U.W.O. PRESCHOOL PROJECT

PROGRESS REPORT: ACADEMIC YEAR 1977-78

MARY J. WRIGHT

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JANUARY 1979

DEPARTMENT OF PSYCHOLOGY
THE UNIVERSITY OF WESTERN ONTARIO LONDON, CANADA

Follow-Up Study of Children in the U.W.O. Preschool Project

Progress Report: Academic year 1977-78

Mary J. Wright

Principal Investigator

The research reported in this Bulletin was supported by grants from Health and Welfare Canada and the Ministry of Community and Social Services of the Province of Ontario.

Abstract

The University of Western Ontario Preschool Project began in the academic year 1973-74. Its purpose was to study the social, motivational and cognitive characteristics of Canadian, white, anglophone children from low-income families, by comparing them with children from middle- and upper-income families, to identify their special needs and to develop an early education program which was appropriate for them.

The initial findings suggested that the differences between the low- and the high-income children were greatest in the cognitive areas and smallest in the motivational and social areas and it was concluded that their greatest need was for cognitive stimulation. A program based on cognitive-developmental theory was therefore designed, which focused on the development of representational skills and conceptual intelligence and this program was successful in inducing, in both the low- and the high-income children, significant cognitive and also social gains.

The goals of the program were long-term as well as short-term. Therefore, the present follow-up study was undertaken to determine if the low-income children maintained their preschool gains in the primary grades and if they were more successful in school than comparable children who had no preschool experience.

The study is still in progress and the size of the subject samples is still small. This Bulletin summarizes the data accumulated by the end of the academic year 1977-78 and describes subject performance at three grade levels (Kindergarten, Grade 1 and Grade 2).

So far the results are encouraging. The preschool graduates have maintained their preschool IQ and other gains; their academic achievements have been generally satisfactory and have been superior to those of the controls; all of them have been promoted each year, but several of the controls have repeated a grade.

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INTRODUCTION

The disappointing results of the National Impact Study of Head Start (S. M. White, 1970) brought compensatory preschool education under attack. Such education, starting at age three or four years, was said to be too little too late (B. L. White, 1973) or the traditional view that mental ability is primarily a reflection of genetics and cannot be substantially changed by experience, was reaffirmed (Jensen, 1969). However, many reasons have been given for the disappointing results of Head Start (Wright, 1973). Some claim that the special needs of the disadvantaged were wrongly identified (Baratz & Baratz, 1970) and that the programs designed for them were inappropriate (Ginsberg, 1972) and others have argued that the methods and criterion measures used to evaluate the programs were inadequate (Bronfenbrenner, 1974; Zigler & Trickett, 1978). Now it has been shown that the benefits of compensatory programs may be long-term rather than short-term (Palmer, 1976) and that follow-up studies of Head Start children were terminated before the effects of these benefits were observed.

Much Head Start research failed to distinguish adequately between cultural and economic disadvantage (Tulkin, 1972) and studies in which low-income minority group children, such as blacks, were compared with middle-income whites were so confounded that no clear conclusions could be reached. Perhaps the long lists of deficits which American investigators have found in the children of the poor are reflections of the bias of the culture of the majority or of other social and political realities which influence the behavior of minority groups (D.H.E.W., 1973). Yet, this impressive scientific literature is read widely by students and teachers

in not only the United States but other English-speaking countries such as Canada, and the undisputed assumption that all lower-class children are inferior is, too often, accepted. Stein (1971) lays the blame for the failures of impoverished children in school on the expectancies of educators who have been influenced by this literature, and others (Rist, 1970; Ryan, 1974) have found evidence that kindergarten and nursery school teachers behave differently with lower- than with middle-class children, perhaps because of their expectations.

There is reason to believe that Canada's economically disadvantaged may be different from those most frequently served by Head Start (Wright, 1973). While Canada is not without its poverty and its cultural biases, it has traditionally valued cultural diversity rather than conformity and the pressures on its minority groups may be somewhat less damaging. In addition, social legislation affecting the conditions of the poor, such as subsidized housing in middle-class suburban areas, low cost or free medical services, and unemployment insurance is somewhat more advanced in this country. It seemed, therefore, that an effort should be made to study the characteristics and needs of some of Canada's economically, disadvantaged children rather than be guided by literature from the United States.

When the Department of Psychology at the University of Western Ontario (UWO) opened its first Laboratory Preschool in the fall of 1973, children from families with both low and high incomes were enrolled and a research program was initiated, the primary purpose of which was to obtain information about the characteristics of Anglophone, Canadian, economically

disadvantaged three- and four-year-olds and to use this information to develop a suitable preschool program for them. The early results of this project suggested that the differences between the high- and the low-income children were greatest in the intellectual, cognitive, and cognitive style areas and smallest in the motivational and social areas. These findings were consistent with those of other investigators (Sigel, 1971; Hunt, 1972) who had concluded that the intellectual problems of the children of the poor derive primarily from difficulty in processing information symbolically, or in representational form and that such difficulties were the result of growing up in a home where there was little cognitive stimulation. It was concluded, therefore, that the primary needs of these children were stimulation with representational materials and a maximum amount of involvement in problem solving activities which would encourage "thinking" in its various forms and the development of conceptual intelligence.

The UWO preschool program which is described in detail elsewhere (Wright, 1976) was, from the start, based on cognitive-developmental theory (Kohlberg, 1968) and the views of John Dewey, W E. Blatz, and Jean Piaget. After the first year the focus was, however, more clearly on thinking. Teaching strategies were directed toward challenging the child to "think things through" in small groups or individual, teacher-planned activities as well as independent, self-directed activities. The development of representational abilities in language and the creative arts (especially dramatics) was emphasized and game-like activities were planned to induce an understanding of concepts of quantity and number, spatial and temporal

relations, seriation, and classification. Problem-solving, making predictions about the outcomes of alternatives for action, recognizing cause and effect relationships in both intellectual and social interaction situations were stressed. This program induced significant immediate cognitive gains in the disadvantaged children who were enrolled in it (Wright, 1978).

A wide variety of types of preschool programs have induced immediate intellectual gains (Weikart, 1967; Klaus & Gray, 1968; Bereiter, 1972), but these gains appear to have been lost after one or two years in the primary grades (Bronfenbrenner, 1974). However, the reduction over time in the differences found between preschool graduates and their controls has reflected in part, gains made by the controls after entry into the primary grades. There is, however, some evidence which suggests that intellectual gains made in preschool by younger subjects (aged three years) are greater and more permanent than those made by children who enter an early education program later (preschool at age four or kindergarten at age five) (Beller, 1972).

The primary purpose of the present project (still in progress) is to assess the long-range effects of the UWO Laboratory Preschool program on the performance of children from low-income families after they enter the primary grades. These effects are measured, primarily, by comparing the performance of the preschool graduates (PGs) with that of a sample of control subjects from low-income families who enter an early education program for the first time at the Kindergarten level. The extent to which the gains made by the PGs in preschool are maintained in the primary grades

is examined, as well as the effects of age at enrollment in this early education program on the size and permanence of the gains made.

The focus of the study is on intellectual and cognitive competence and academic achievement but the childrens' social behavior and adjustment in the school system and their attitudes toward teachers as well as school work are also assessed.

METHOD

Subjects

There are three groups of subjects. Two consist of preschool graduates (PGs): Group A (PGs who started preschool as three-year-olds) and Group B (PGs who started preschool as four-year-olds). The third, Group C, is made up of control subjects (children who entered Kindergarten as five-year-olds without any prior group care or early education).

The preschool subjects were selected on the basis of their socio-economic status (SES), age, sex, and if they had no prior group care or education. Half were from single-parent (mother present) and half from two-parent families. Half were boys and half girls. They were not pre-tested or selected on the basis of test scores. Their intial assessment began in mid-October, more than a month after enrollment, when they were familiar with the preschool setting.

The control subjects were selected on the basis of pre-testing as well as SES, age, and sex, to equate Group C with groups A and B. The purpose of the pre-testing was to select children whose cognitive competence (relative to their age group) was, at the beginning of Kindergarten, similar to that of the PGs at the beginning of their first preschool year. The primary criterion measure was the Preschool Inventory (1970 edition)

percentile score. This test was used because its authors suggest that it reflects the degree of disadvantage a child has suffered. Binet IQs were also used, as a supplementary measure.

As they now stand (for follow-up purposes) the groups are only approximately equated on all of the variables. This is due to attrition and the difficulty in locating suitable control subjects (described elsewhere, Wright, 1977). Their mean SES indices (Blishen, 1967) are as follows: Group A 30.52 (SD 3.92), Group B 30.25 (SD 5.22), Group C 32.52 (SD 8.01). Their mean Preschool Inventory Percentile scores at entrance to preschool or school were: Group A 20.9 (SD 26.9), Group B 61.0 (SD 31.8), Group C 59.3 (SD 24.0) and their mean IQs were: Group A 87.4 (SD 11.7), Group B 93.2 (SD 11.83), Group C 90.6 (SD 11.0).

Thus, Group C appeared to be slightly less disadvantaged than the two PG groups and at the start to be somewhat more cognitively competent than Group A but slightly less competent than Group B. A complete description of the groups by individual subject, showing their sex, age, SES index and test scores, at entry to the project, are shown in Appendix A.

The number of different subjects in the project in 1977-78, including five who were still in the preschool, is shown by group and year of public school entrance below.

Year of Public School Entrance	Group A	Group B	Group C	Total
1974-75	0	1	0	1
1975-76	8	1	6	15
1976-77	4	0	12	16
1977-78	12	5	6	23
1978-79	0	5		5
Totals	24	12	24	60

The number of subjects on whom data have now been accumulated at each of four levels (shown by year in school and grade level) is as follows:

First (Kindergarten)	55	(31 PGs, 24 controls)
Second (Grade 1)	32	(14 PGs, 18 controls)
Third (Grade 1 and 2)	15	(9 PGs, 6 controls)
Fourth (Grade 3)	1	(1 PG, 0 controls)

In the results section it will be found that the number of subjects vary somewhat by testing time. This is because (a) during some assessment periods, one or other of the subjects was temporarily lost, (b) two subjects were permanently lost in mid-year and were assessed in the fall but not the spring and (c) one control subject, in her third year in school, was repeating Grade 1 and was not given the Grade 2 academic achievement tests.

Perhaps it is permissible to note here that by the end of 1978-79 the failure rate in the control group will present a serious methodological problem. Six of the controls, but none of the PGs, have now failed a year (five Grade 1 and one Grade 2). If failing subjects are not given tests for their "year-in-school" group, the effect will be to compare the PGs with only the "best" of the controls rather than the total sample and thus distort the findings.

Schools attended. In 1977-78 the subjects were enrolled in 28 different schools (PGs in 20 and controls in 15). These schools were in widely separated areas of the city. In eight schools there were both PGs and controls but in 13 there were only PGs and in seven there were only controls.

School changes. More PGs than controls changed schools once or more during the school year (30% of the PGs as compared with 4.3% of the controls).

One PG was in as many as four schools. This finding is consistent with the SES index data suggesting that the controls as a group, come from somewhat more stable homes than do the PGs.

Assessment Criteria

The names of the tests and measures used at each grade level are presented in Table 1. All of the measures are standardized tests except

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Insert Table 1 about here

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the School Adjustment Report and the Behavior Rating Scale, both of which are completed by the teachers. The School Adjustment Report was developed by the present investigator and a copy of it is appended (see Appendix B). The Behavior Rating Scale includes 50 items. The first 20 were taken from a Behavior Inventory developed for assessing the outcome of Head Start programs by Hess and Shipman (1965). The next 21 were from the Devereux Elementary School Behavior Rating Scale (Spivack & Swift, 1967). The last nine were made up by the present investigator to obtain additional information but the results obtained with these are not reported here.

The measures were used to assess (a) cognitive competence (Preschool Inventory, Circus tests, and KRISP or MFF), (b) intellectual ability (Binet IQ), (C) academic achievement (Stanford Achievement tests, School Adjustment Report), and (d) personal-social adjustment in school (School Adjustment Report and Behavior Rating Scale).

Procedure

There were two assessment periods each year, one in the fall and the other in the spring. Some tests were given at both and some at only

Table 1

Names of the Tests and Measures used at the Kindergarten and Primary Grade Levels

KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3
Stanford Binet	Stanford Binet (F)	Stanford Binet (F)	Stanford Binet (F)
Preschool Inventory			
Circus: Say & Tell Form A	Circus: Say & Tell (S) Form B		
Circus: Think it Through Form A	Circus: Think it Through (S) Form B		
	Circus: How Much & How Many (S) Form B		
Stanford Early School Achievement Level I	Stanford Early School Achievement Level II	Stanford Achievement Tests Primary I Battery (F) Primary II Battery (S)	Stanford Achievement Test Primary II Battery
Kansas Reflection-Impulsivity Scale for Preschoolers	Kansas Reflection-Impulsivity Scale for Preschoolers	Matching Familiar Figures Test	Matching Familiar Figures Test
Behavior Rating Scale (S)	Behavior Rating Scale (S)	Behavior Rating Scale (S)	Behavior Rating Scale (S)
School Adjustment Report (S)	School Adjustment Report (S)	School Adjustment Report (S)	School Adjustment Report (S)

Note

1. All measures administered in both the Fall and Spring unless otherwise indicated as follows: (F) Fall Only, (S) Spring Only.

one of these assessment times as indicated in Table 1 presented above. At the Kindergarten level, in the fall, the Preschool Inventory was given first and then the Binet (October) and the rest of the tests were administered in no fixed order in November. At the higher grade levels, the Binet was also the first test given. In the spring (late April, May, and June) when tests given in the fall were readministered, the children were tested in the same order as they had been in the fall.

Only one test was given to any child on a single day. There were four testers, one of whom administered only the initial Preschool Inventories. The other three did all of the rest of the testing, but administered different tests at each assessment time to avoid expectancy effects.

RESULTS

To avoid confusion, the results will be presented in separate sections by grade level. In the first section the data accumulated at the Kindergarten level will be reported and discussed. The second and third sections will deal similarily with the data accumulated at the first and second grade levels respectively.

Because the samples are still small, especially at the first and second grade levels, no elaborate statistical procedures have been applied to the data. Only means or percentages are reported, along with the number of subjects on which these are based. When appropriate, the results are also presented graphically to show more clearly the trends which are emerging.

Kindergarten Level Results

Preschool Inventory Percentile Scores

The mean Preschool Inventory Percentile scores for each group at each level and assessment time (through preschool to the end of Kindergarten) are presented in Table 2. Changes in the mean scores over time are shown graphically in Figure 1.

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Insert Table 2 and Figure 1 about here

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The two PG groups (A and B) showed no decline in performance at the Kindergarten level but made no further gains. The control group made substantial gains in Kindergarten (14 points), but the gaps between this group and the two PG groups were not closed.

The effects of age were in the expected direction. Group A (at age three) gained more in its first preschool year (37.3 points) than did Group B (at age four) in its first preschool year (11.3 points) or Group C (at age five) in its first year in school (14.0 points). It is, however, noteworthy that both of the PG groups made summer holiday mean score gains after their first year in preschool (Group A 12 points and the seven Group B subjects now in Kindergarten 12.1 points). Group A did not make large additional summer holiday gains after its second preschool year and, unfortunately, it is not known whether Group C made significant gains in the summer following its first year in school at the Kindergarten level.

Binet IQ

The mean Binet IQs for each group at each age level tested (preschool to Grade 3) are presented in Table 3 and changes in the mean scores over time to the end of Kindergarten are shown graphically in Figure 2.

Table 2

Mean and (SD) Preschool Inventory Percentile scores for each group at each age level and assessment time to the end of Kindergarten

Age Level and Assessment Time	Group A n		Group B n		Group C n	
Preschool (three-year-old level)						
Fall	24	20.9 (26.9)				
Spring	24	58.2 (29.0)				
Preschool (four-year-old level)						
Fall	24	70.2 (24.9)	12	61.0 (31.8)		
Spring	24	85.9 (16.7)	12	72.3 (23.8)		
Kindergarten (five-year-old level)						
Fall	22	87.7 (17.6)	7	89.7 (8.9)	24	59.3 (24.0)
Spring	23	87.2 (17.2)	7	89.7 (11.4)	24	73.3 (15.8)

Note

Percentile scores are directly comparable from one age level to another.

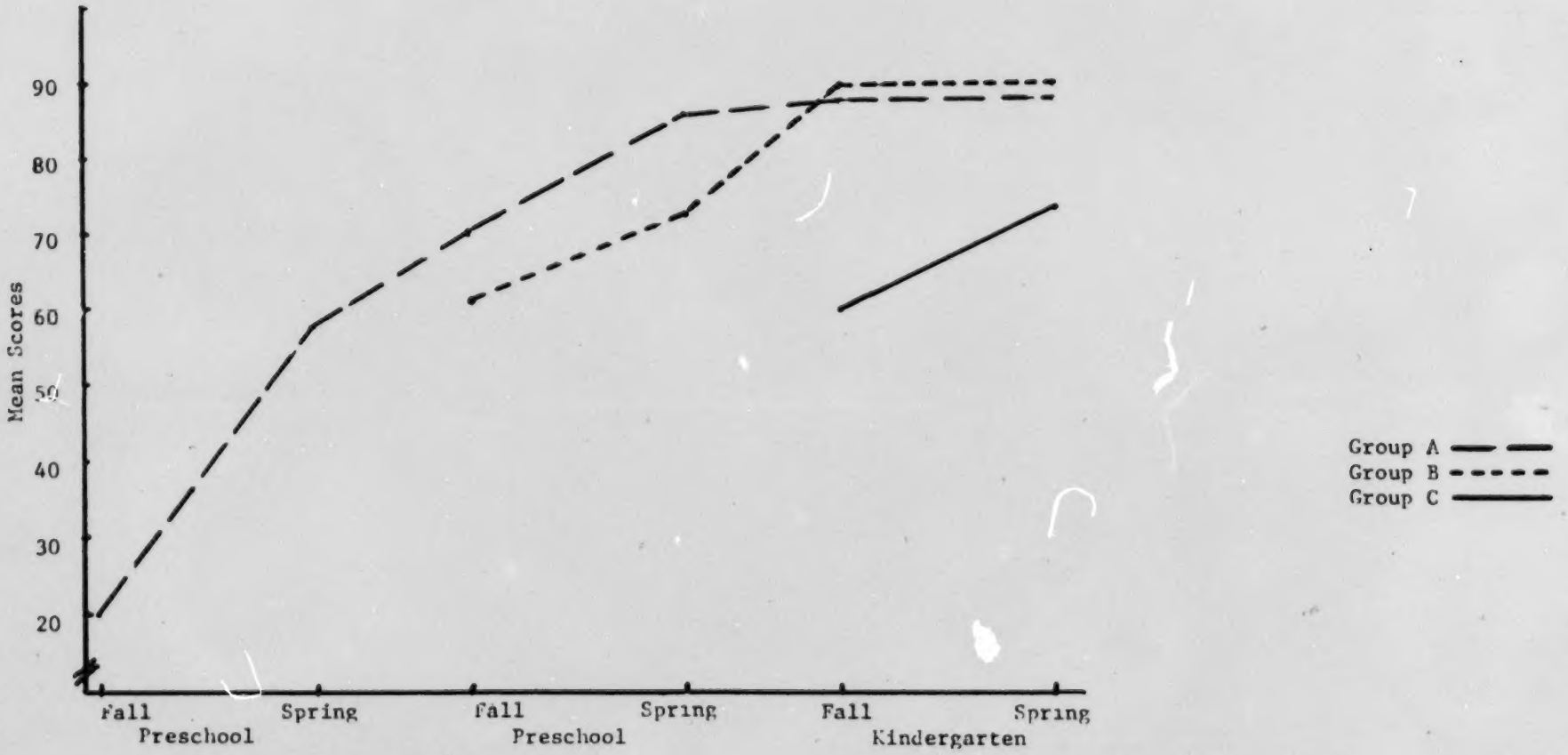

Figure 1: Changes in the mean Preschool Inventory Percentile scores from entry into preschool (or school) to the end of kindergarten by group.

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Insert Table 3 and Figure 2 about here

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The IQs of the PG groups did not decline in Kindergarten but continued to increase slightly. The mean IQ of Group C also increased (four points) but not enough to close the gaps between this group and the two PG groups.

The effects of age were in the expected direction. First-year-in-school gains were: Group A (at age three) 9.2 points, Group B (at age four) 7.5 points, and Group C (at age five) 4 points.

Circus "Say and Tell", Form A (Language)

Mean scores for the Functional Language section of this test are presented by group, age level, and assessment time in Table 4. Changes in the means over time are shown graphically in Figure 3.

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Insert Table 4 and Figure 3 about here

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There was no decline in the Functional Language performance of the two PG groups at the Kindergarten level. Instead they continued to improve, especially Group B which gained just about as much in Kindergarten as in its single preschool year. Although by the end of preschool the PG groups were still performing slightly below average (as judged by U.S. national means), they made summer holiday gains and in Kindergarten, in both the fall and the spring, their performance was average or above average.

In Kindergarten, Group C improved somewhat more than Group A but somewhat less than Group B. Thus, there was some narrowing of the gap between groups A and C but a slight widening of the gap between groups B and C. However, by the end of Kindergarten the performance of Group C was still slightly below average.

Table 3

Mean and (SD) Binet IQ scores for each group at each age level and assessment time

Age Level and Assessment Time	Group A n		Group B n		Group C n	
Preschool (three-year-old level)						
Fall	16	87.4 (11.7)				
Spring	16	96.6 (11.4)				
Preschool (four-year-old level)						
Fall	24	95.2 (13.8)	11	93.2 (11.8)		
Spring	23	102.6 (10.1)	12	100.7 (11.5)		
Kindergarten (five-year-old level)						
Fall	23	102.7 (10.2)	7	102.1 (8.0)	24	90.6 (11.0)
Spring	23	104.4 (11.3)	7	105.6 (5.3)	24	94.6 (11.3)
(six-year-old level)						
Fall	12	107.8 (10.2)	2	108.0 (22.7)	18	95.8 (7.7)
(seven-year-old level)						
Fall	7	105.3 (13.0)	2	102.5 (17.7)	6	94.2 (8.9)
(eight-year-old level)						
Fall			1	118.0		

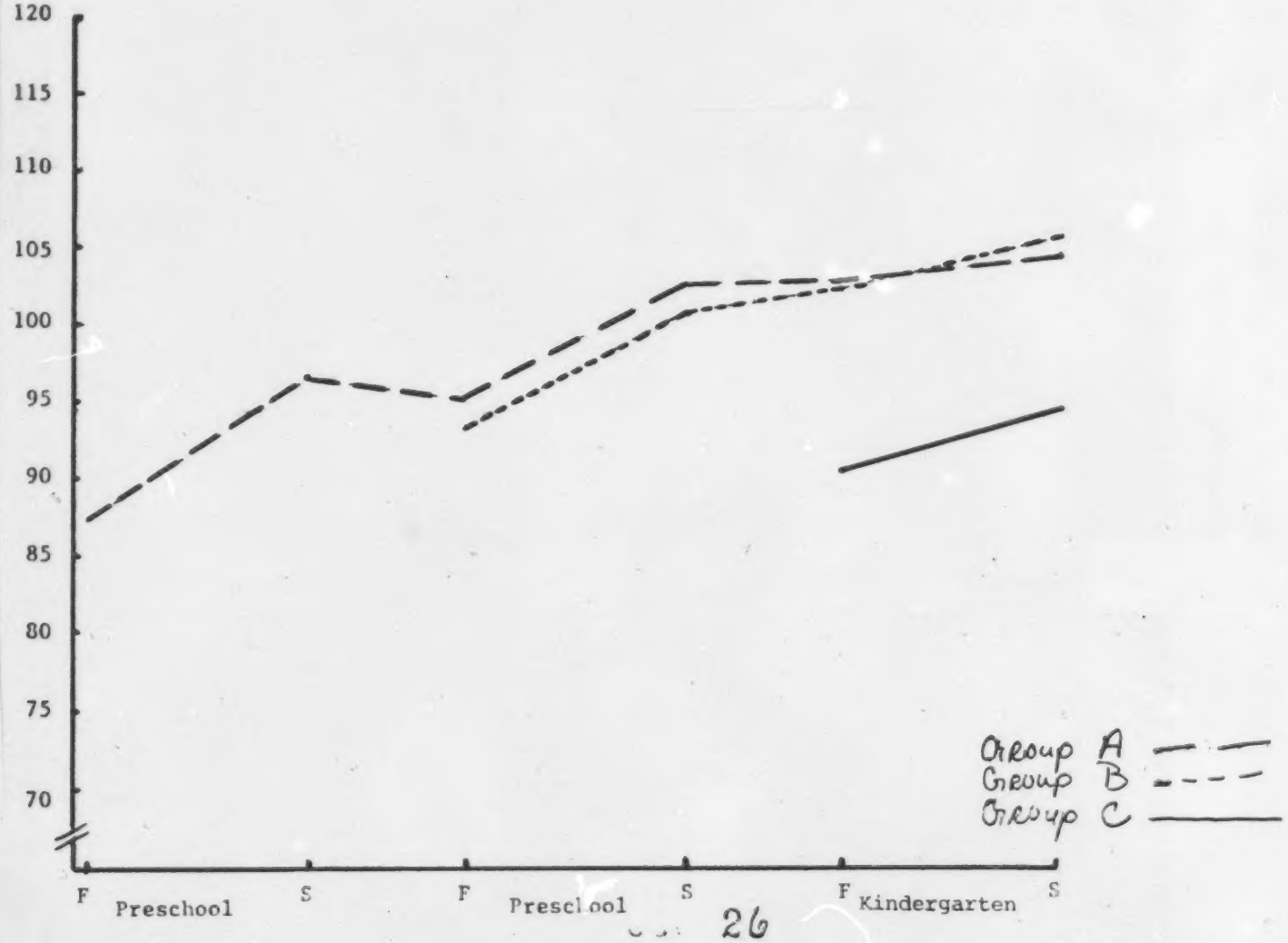

Figure 2: Changes in the mean Binet I.Q.'s from entry into Preschool (or school) to the end of Kindergarten, by group.

Table 4

Mean and (SD) Circus "Say and Tell" Form A Functional Language scores for each group at each age level and assessment time to the end of Kindergarten

Age Level and Assessment Time	Group A n		Group B n		Group C n	
Preschool (three-year-old level)						
Fall	16	17.9 (15.6)				
Spring	16	30.3 (15.8)				
Preschool (four-year-old level)						
Fall	24	37.6 (11.4)	11	34.2 (17.2)		
Spring	24	47.6 (9.9)	11	43.8 (14.9)		
Kindergarten (five-year-old level)						
Fall	23	55.6 (8.2)	7	51.0 (16.2)	24	42.7 (6.3)
Spring	23	57.7 (8.5)	7	59.4 (8.7)	24	50.4 (8.6)

Note

U.S. National Means and (SDs)
Preschool level: 49.5 (13.0)
Kindergarten level: 51.0 (13.7)

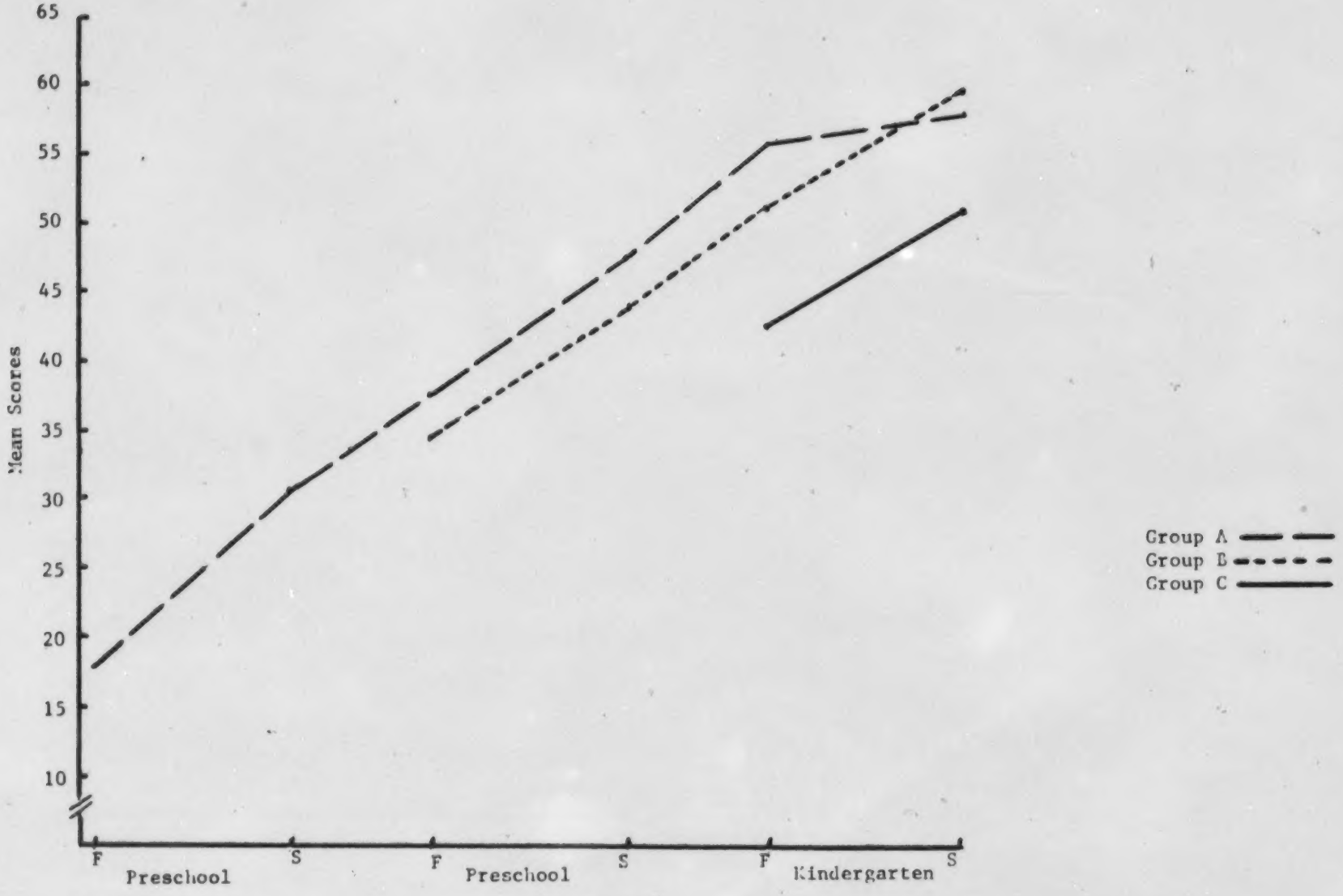

Figure 3: Changes in the mean Circus "Say and Tell" functional language scores from entry into Preschool(or school) to the end of kindergarten, by group.

Circus "Think it Through", Form A (Problem Solving)

The mean total scores on this test are presented by group, age level, and assessment time in Table 5. Changes in the means over time are shown graphically in Figure 4.

- -

Insert Table 5 and Figure 4 about here

- -

Again, there was no decline in the performance of the two PG groups. Instead, they continued to improve, especially Group B which gained on this test about as much as it had in its one preschool year. Group C gained no more than Group A and somewhat less than Group B and showed no signs of "catching up" to either of the PG groups.

It is noteworthy also that although at the end of preschool and the beginning of Kindergarten the two PG groups were still performing at a slightly below average level (as judged by U.S. national means), by the end of Kindergarten their performance was average. The control group, on the other hand, made relatively small gains in Kindergarten and at the end of the year was performing at a level lower than the average for even preschool children.

Stanford Early School Achievement Tests, Level 1

Mean scores on this battery of tests are presented by group and assessment time in Table 6. Changes in the means from fall to spring are shown graphically in Figure 5.

- -

Insert Table 6 and Figure 5 about here

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Table 5

Mean and (SD) Circus "Think it Through" Form A total scores for each group at each age level and assessment time to the end of Kindergarten

Age Level and Assessment Time	n	Group A	n	Group B	n	Group C
Preschool (three-year-old level)						
Fall	16	7.6 (5.2)				
Spring	16	12.5 (5.6)				
Preschool (four-year-old level)						
Fall	24	15.1 (5.4)	11	12.5 (5.5)		
Spring	24	19.9 (3.6)	11	18.6 (5.2)		
Kindergarten (five-year-old level)						
Fall	23	21.7 (3.3)	7	18.6 (6.2)	24	17.6 (4.7)
Spring		23.7 (3.8)	7	24.9 (5.0)	24	19.7 (3.8)

Note

U.S. National Means and (SDs)
Preschool level: 21.5 (5.7)
Kindergarten level: 22.2 (5.4)

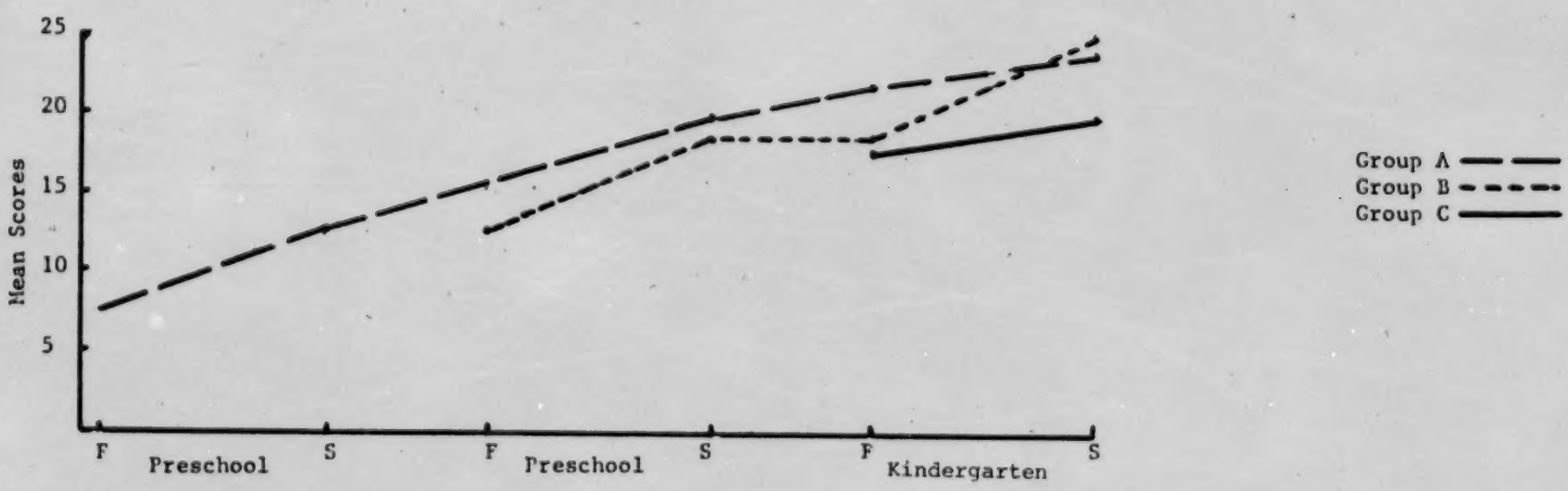

Figure 4: Changes in the mean Circus "Think it Through" total scores over time from entry into preschool (or school) to the end of kindergarten, by group.

Table 6

Mean and (SD) Stanford Early School Achievement, Level I scores by group and testing time at the Kindergarten level

Test	Group A		Group B		Group C	
	Fall (n=23)	Spring (n=23)	Fall (n=6)	Spring (n=6)	Fall (n=24)	Spring (n=24)
Environment	30.2 (5.7)	33.2 (4.2)	29.0 (5.8)	31.3 (3.6)	22.5 (4.8)	28.3 (5.3)
Mathematics	16.2 (4.5)	18.2 (4.5)	14.8 (5.3)	19.7 (3.7)	11.2 (3.1)	14.4 (4.1)
Letters and Sounds	14.9 (4.9)	19.0 (5.2)	16.5 (5.0)	20.5 (4.6)	11.7 (4.8)	16.0 (5.3)
Aural Comprehension	17.9 (4.0)	20.6 (3.2)	15.3 (5.6)	19.3 (5.2)	13.5 (3.2)	16.4 (4.7)
Total Score	79.0 (15.9)	86.7 (21.0)	75.7 (18.3)	90.8 (15.6)	58.4 (10.6)	75.1 (15.0)

Note

Range of scores in Stanine 5 (average performance based on U.S. standardization data)

Beginning Kindergarten (Fall)		End of Kindergarten (Spring)	
Environment	26-29	Environment	33-35
Mathematics	12-13	Mathematics	19-21
Letters and Sounds	10-11	Letters and Sounds	17-20
Aural Comprehension	15-17	Aural Comprehension	19-21
Total Score	63-73	Total Score	87-96

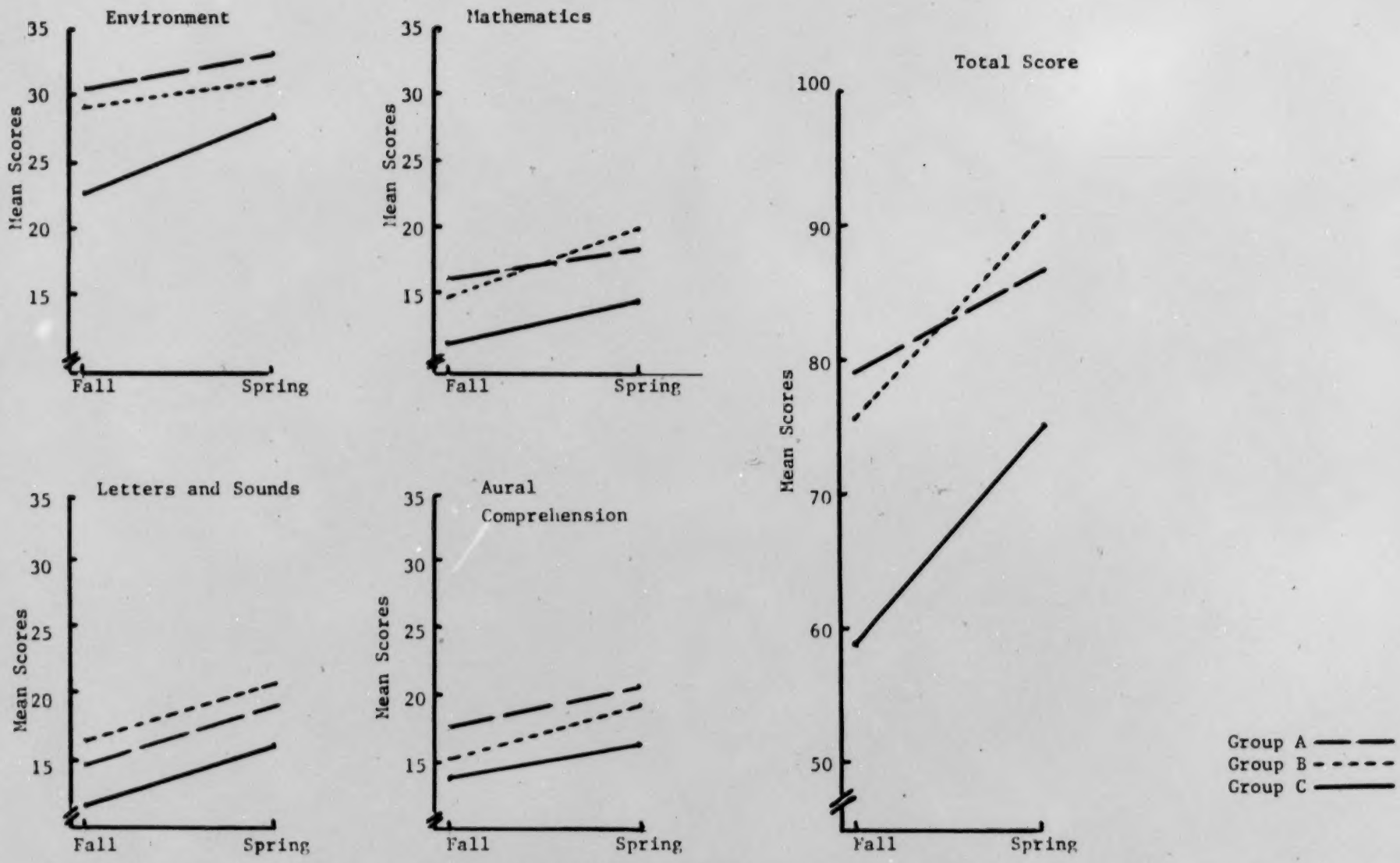

Figure 5: Changes in the mean Stanford Early Achievement Level I scores from fall to spring in kindergarten by group.

At the beginning of Kindergarten the overall academic achievement of each of the PG groups was higher than that of the control group and by the end of the school year, although there was a slight narrowing of the gap between groups A and C there was no change in the difference between groups B and C.

As judged by U.S. standards, the achievement of each of the two PG groups was above average at entry into Kindergarten in all areas assessed, but only average at the end of Kindergarten and below average in Mathematics. This, however, raises the question of whether it is appropriate to compare the academic achievement of children in Canadian schools with that of children in schools in the United States, because achievement depends on what is taught as well as a child's ability to learn. In London, Ontario where this study was done the emphasis in Kindergarten is on the development of language, pre-reading and social skills rather than Mathematics. The performance of Group C was below average in all areas assessed in both the fall and the spring.

Teacher Reports of School Adjustment and Performance

The teachers' responses to the questions they were asked about the subjects at the end of their Kindergarten year are summarized in Table 7.

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Insert Table 7 about here

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These data suggest that the PGs in Group A adjusted to Kindergarten better (question 1), were somewhat more positive in their attitudes to school, teachers and school work (question 2), and were better adjusted personally and socially (question 8) than were either the PGs in Group B

Table 7

Summary of Teacher Reports of adjustment and performance in Kindergarten

1. How well has this child adjusted to your class?

Group A	17.4	above average	78.3	average	4.3	below average
Group B	0	above average	83.3	average	16.7	below average
Group C	12.5	above average	66.7	average	20.8	below average

2. Are this child's attitudes toward school, teachers, and school work positive?

Group A	21.7	above average	73.9	average	4.3	below average
Group B	0	above average	100.0	average	0	below average
Controls	16.7	above average	75.0	average	8.3	below average

3. Was this child well prepared academically for the work of your class?

Group A	34.8	above average	52.2	average	13.0	below average
Group B	0	above average	83.3	average	16.7	below average
Group C	12.5	above average	33.3	average	54.2	below average

4. How well has this child progressed academically during the current year?

Group A	26.1	above average	60.9	average	13.0	below average
Group B	0	above average	83.3	average	16.7	below average
Controls	13.0	above average	65.2	average	21.7	below average

5. Did this child need remedial help?

Group A	91.7	No	8.3	Yes
Group B	100.0	No	0	Yes
Group C	75.0	No	25.0	Yes

6. Did this child attend school regularly?

Group A	87.0	Yes	13.0	No
Group B	83.3	Yes	16.7	No
Group C	87.5	Yes	12.5	No

7. Was this child promoted to the next grade?

Group A	100.0	Yes	0	No
Group B	100.0	Yes	0	No
Group C	100.0	Yes	0	No

8. What is your general appraisal of this child's personal and social competence?

Group A	73.9	good	17.4	some concern	8.7	poor
Group B	16.6	good	66.7	some concern	16.7	poor
Group C	56.5	good	39.1	some concern	4.3	poor

9. What is your general appraisal of this child's academic competence?

Group A	39.1	above average	47.8	average	13.0	below average
Group B	0	above average	83.3	average	16.7	below average
Group C	4.3	above average	56.5	average	39.1	below average

Notes

1. Ns for groups A, B, and C are 23, 6, and 24, respectively.
2. No report was obtained on the 24th Group A subject but this subject received no remedial help and was promoted (questions 5 and 7).
3. All figures are percentages.

or the controls. The PGs in Group B were appraised somewhat more favourably than the controls on questions 1 and 2, but less favourably on question 8. Concern was expressed about the personal-social adjustment of five of the six Group B subjects who were assessed.

Also, academically, the PGs in Group A were judged to be better prepared for school (question 3) and more competent (question 9) than were either the PGs in Group B or the controls. The preparation for school and the academic competence of over a third of the Group A subjects was judged to be above average, but the preparation of over half and the academic competence of over one third of the control subjects was considered below average. In Group B none of the six subjects assessed were judged to be above average but only one was considered below average in preparation for school and academic competence.

More of the controls than the PGs received remedial help during the year (question 5) but all of the subjects in all groups were promoted to Grade 1 (question 7).

Behavior Rating Scale

Mean teacher ratings of the classroom behavior of the subjects at the Kindergarten level are presented in Table 8.

- - - - - - - - - - - - - -

Insert Table 8 about here

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The behavior of the three groups, as assessed by this measure, did not appear to differ very much. Although the trends favoured Group A over the other two groups on eight of the ten dimensions, they also favoured Group C over Group B on eight of the ten dimensions. The only dimensions on which

Table 8

Mean and (SD) Behavior Rating Scale scores at the end of Kindergarten by group

Dimension	Group A (n=23)	Group B (n=6)	Group C (n=24)
1. Aggression	12.6 (3.1)	10.2 (3.1)	13.3 (3.0)
2. Verbal-Social Interaction	11.9 (3.1)	10.8 (2.6)	12.2 (3.6)
3. Timidity	12.7 (2.6)	10.2 (2.4)	12.1 (3.5)
4. Independence	12.3 (2.3)	11.5 (2.1)	10.9 (2.5)
5. Achievement Motivation	12.2 (2.8)	9.3 (1.5)	11.0 (2.9)
6. Impatience	10.9 (3.4)	9.2 (1.9)	10.6 (3.0)
7. External Reliance	14.1 (2.8)	12.8 (2.9)	11.1 (2.8)
8. Inattentive-Withdrawn	12.6 (2.3)	8.5 (2.9)	11.0 (2.9)
9. Creative-Initiative	10.3 (2.9)	8.0 (2.3)	9.0 (3.4)
10. Need for Closeness	11.8 (3.0)	10.2 (1.6)	11.6 (3.3)

Note

For Aggression, Timidity, Impatience, External Reliance, Inattentive-Withdrawn, higher scores indicate less of the behavior.

both Group A and B scored slightly higher than Group C were independence and self- (rather than external) reliance.

These results are consistent with the teachers' remarks, in the open-ended questionnaire, about the personal-social adjustment of the subjects. They suggest that the PGs in Group B, who had only one year in preschool, displayed less effective school behavior in Kindergarten than did the PGs in Group A who had had two years in preschool and also less effective behavior, as judged by the teachers, than the control subjects who had had no preschool experience.

Kansas Reflection-Impulsivity Scale (KRISP)

The number of subjects in each classification category for this match-to-sample perceptual discrimination test are presented by group and assessment time in Table 9.

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Insert Table 9 about here

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A larger percentage of the PGs than the controls performed satisfactorily on this measure (i.e., were very reflective, reflective, average, or fast-accurate). The percentage of subjects in these categories (combined), in groups A, B, and C respectively was 65, 100, 42 (in the fall) and 87, 86, 46 (in the spring). More PGs than controls were reflective and fewer were impulsive at each assessment time.

Summary of Findings, Kindergarten Level

Intelligence and Cognition. These findings indicate that the IQ gains and the cognitive gains made by the PGs in preschool were maintained at the Kindergarten level. There was no decline in their IQs or their Preschool

Table 9

Number of subjects in each KRISP category by group and testing time at the Kindergarten level

	Group A (n=23)		Group B (n=7)		Group C (n=24)	
	Fall	Spring	Fall	Spring	Fall	Spring
Slow-Accurate						
Very Reflective	2	3	0	0	0	0
Reflective	2	2	0	2	1	0
Average	7	7	5	3	6	6
Fast Accurate	4	8	2	1	3	5
Fast-Inaccurate						
Very Impulsive	1	0	0	0	8	1
Impulsive	6	1	0	1	5	7
Slow-Inaccurate	1	2	0	0	1	5

Inventory Percentile scores and they continued to improve their cognitive abilities with age as measured by these two tests and the Circus tests.

The age at which the subjects began preschool or school appeared to be an important variable in determining the immediate impact of their early education. Those who were enrolled as three-year-olds (Group A) made the greatest initial gains. However, those who were enrolled as four-year-olds appeared to benefit cognitively from their year in preschool more than was immediately apparent. During the summer following their year in preschool they made further gains, comparable in size to those made by the Group A subjects after their first preschool year, and then were able to utilize their Kindergarten year to improve their Language and Problem Solving skills (as measured by the Circus tests) to a level comparable to that attained by Group A.

The controls improved their Preschool Inventory Percentile scores in Kindergarten but the PG groups did not, suggesting that the PGs were functioning on this measure at a level which was consistent with their capacity. However, the gains made by the controls were not as great as those made by the PGs in preschool or in the summers following preschool, so that by the end of Kindergarten they had not "caught up" to the PG groups. Also, although Group C gained 4 IQ points and groups A and B only 2 and 3 IQ points respectively in Kindergarten, this IQ gain was smaller than that made by the PGs in preschool. Therefore, here again Group C failed to "catch up" to the PG groups.

On the Circus tests (Language and Problem Solving) Group C tended to gain somewhat more than Group A but less than Group B and less than the PGS

had gained in preschool. Thus, on these measures the controls also failed to "catch up".

Academic Achievment. The PGs were clearly better prepared for school academically than were the controls as indicated by their higher fall scores on the Stanford Achievement tests and also the judgments of their teachers. Both the PGs and the controls improved their academic performance during the year and although there was a slight narrowing of the gap between groups A and C (reflecting slightly greater improvement for the controls), Group B gained as much as Group C and the difference between these two groups was not changed.

School Behavior and Personal-Social Adjustment. The teachers' judgments of the behavior and adjustment of the subjects generally favoured the PGs in Group A over the controls but the controls over the PGs in Group B. This finding suggests that two years of preschool experience (Group A) had greater positive effects on the social adjustment and learning styles of the PGs than one year in preschool (Group B). However, it is difficult to interpret the finding that the PGs with at least one year of preschool experience, appeared to be adjusting more poorly than the controls, who had no preschool experience. Because the sample of Group B subjects is still small this finding may be spurious. It is also inconsistent with the results obtained with the Kansas Reflection-Impulsivity Scale which suggest that the cognitive styles of the Group B subjects were more efficient than those of the controls.

The only behavioral dimensions on which the PGs in both groups were judged to be somewhat superior to the controls were independence and self-reliance.

Grade 1 Results

At this level data have been accumulated on 32 subjects (Group A = 12, Group B = 2, Group C = 18).

Binet IQ

The mean IQs of the groups at this level were presented in Table 3. They were 107.8 (Group A), 108 (Group B) and 95.8 (Group C). There was no decrease in the scores of the PG groups. Instead, they continued to increase as did the mean score of the control group.

Circus "Say and Tell", Form B

Mean scores for groups A and C on Form B of this test are presented in Table 10. Results for Group B are not reported because they were available for only one subject.

- - - - - - - - - - - - - - -

Insert Table 10 about here

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There was little difference between the groups on Description, but Group A performed slightly better than Group C on Functional Language (giving the proper forms for plurals, verbs, comparisons and conjunctions). On Narration (the ability to make up a story in response to a picture) the Group A subjects were more voluble than the controls (number of words) but not different from them in the proportion of different words to the number of words used. However, the quality of the stories produced by Group A (as measured by the number of external events) was superior to those produced by Group C. What is assessed on this measure (external events) is the number of times events are tied to specific causes (e.g., conjunctive phrases are used such as if, since, because, so that, although; "Since

Table 10

Mean and (SD) Circus "Say and Tell" Form B scores

for groups A and C at the end of Grade 1

Section of Test	Group A (n=11)	Group C (n=18)	U.S. National Means
Part I Description			
Pencil A responses	7.5 (0.7)	7.0 (0.7)	7.0 (1.4)
Dollar A responses	2.6 (0.8)	2.7 (0.7)	3.8 (1.8)
Part II Functional Language			
Total A responses	21.6 (4.5)	18.7 (3.4)	14.1 (3.7)
Part III Narration			
Number of words	110.8 (51.3)	86.6 (32.0)	56.6 (34.7)
Number of different words	49.1 (24.4)	39.6 (15.8)	
Ratio of different words to total words	.5 (0.2)	.5 (0.2)	.5 (.1)
Ratio of different situations to total words	.1 (0.2)	.2 (0.1)	.2 (.1)
Number of external events	4.7 (4.5)	2.2 (1.9)	1.4 (3.1)

he was late he had to hurry"), the number of times a character is animated (e.g., "He thinks he'll go", "He wants to...") and the number of times an external event or object not pictured is introduced (e.g., "Then he went home").

It is noteworthy that both groups were peforming at or above the U.S. national means on both Functional Language and Narration.

Circus "Think it Through" and "How Much and How Many", Form B

Mean scores for groups A and C on the B forms of these two tests are presented in Table 11. Again, the results for Group B are not presented because they were available for only one subject.

- - - - - - - - - - - - - - -

Insert Table 11 about here

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"Think it Through". Group A performed better than Group C on Word Problems (Classification) but not consistently better on the other two sections of this test. As judged against the U.S. national means on Word Problems, the mean score of Group A was above average (better than 67.6% of the U.S. sample), but the mean of Group C was below average (better than only 10.9% of the U.S. sample). However, both of the groups performed at a slightly below average level on the other two sections of this test.

"How Much and How Many". The performance of Group A was consistently better than that of Group C on all parts of this test. As judged against the U.S. national means the performance of Group A was above average (on Part I above 68.3% and on Part II above 90.2% of the U.S. sample), but the performance of Group C was below average (on Part I above only 34.2% and on Part II above only 36.6% of the U.S. sample).

Table 11

Mean and (SD) Circus "Think it Through" and "How Much and How Many"

Form B scores for Groups A and C at the end of Grade 1

Measure	Group A (n=11)	Group C (n=18)	U.S. National Means
Think it Through			
Word problems (classification)	11.8 (1.5)	9.6 (4.1)	11.1 (1.1)
Patterns (deducing and applying rules)	5.0 (2.4)	5.4 (2.0)	5.6 (1.2)
Mazes (selecting shortest path to goal)	5.1 (1.4)	4.8 (1.4)	5.5 (0.6)
How Much and How Many			
Part I (counting, numerical concepts, adding, subtracting)	26.0 (5.0)	23.4 (3.6)	24.5 (4.2)
Part II (mathematical concepts and conservation)	20.7 (4.6)	17.9 (3.5)	18.3 (2.7)

Stanford Early School Achievement Tests, Level II

This battery of tests was administered at both the beginning and end of the subjects' Grade 1 year. Mean scores for groups A and C at each testing time are presented in Table 12. Changes in the means from fall to spring are shown graphically in Figure 6.

- -

Insert Table 12 and Figure 6 about here

- -

The performance of Group A was consistently better than that of Group C on all of the tests in this battery. As judged against the U.S. national means, in both the fall and the spring, the achievement of Group A was average or slightly above average in all of the areas assessed except Mathematics, but the achievement of Group C was below average in all of the areas at both testing times. Also, as shown in Figure 6 there was no narrowing of the gap between the total scores of the two groups.

Teacher Reports of School Adjustment and Performance

The responses of the teachers to the questions they were asked about the subjects at the end of their Grade 1 year are summarized in Table 13.

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Insert Table 13 about here

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In general, the teachers' judgments favoured the PGs. Fifty percent of the Group A subjects (but only 11% of the controls) were judged to be above average in their adjustment to the classroom (question 1), and 50% of the Group A subjects (but only 22% of the controls) were described as above average in

Table 12

Mean and (SD) Stanford Early School Achievement, Level II scores for groups A and C at the beginning and end of Grade 1

Test	Group A Fall (n=12)	Group A Spring (n=11)	Group C Fall (n=18)	Group C Spring (n=18)	U.S. Norms: Fall	Stanine 5[1] Spring
Environment	23.9 (5.3)	28.0 (5.6)	19.5 (3.6)	21.6 (3.7)	23-25	25-27
Mathematics	27.1 (8.9)	41.8 (9.4)	21.3 (5.0)	36.8 (7.9)	29-33	43-46
Letters and Sounds	30.7 (6.8)	37.7 (2.4)	22.6 (8.5)	34.1 (4.4)	28-32	37-38
Aural Comprehension	17.9 (2.9)	20.1 (2.8)	13.6 (3.8)	16.8 (4.4)	16-17	19-20
Word Reading	29.9 (6.1)	50.8 (5.6)	22.8 (9.9)	42.9 (9.9)	23-28	49-53
Sentence Reading	TNA[2]	21.4 (11.4)	TNA[2]	12.7 (11.4)	-	18-25
Total Score	129.5 (23.4)	192.9 (26.0)	98.4 (26.1)	155.7 (23.4)	-	190-191

Notes

[1] The range of scores in Stanine 5 represent average performance at the beginning of Grade 1 (fall) and the end of Grade 1 (spring).

[2] TNA = test not administered (because the subjects had received no instruction in sentence reading).

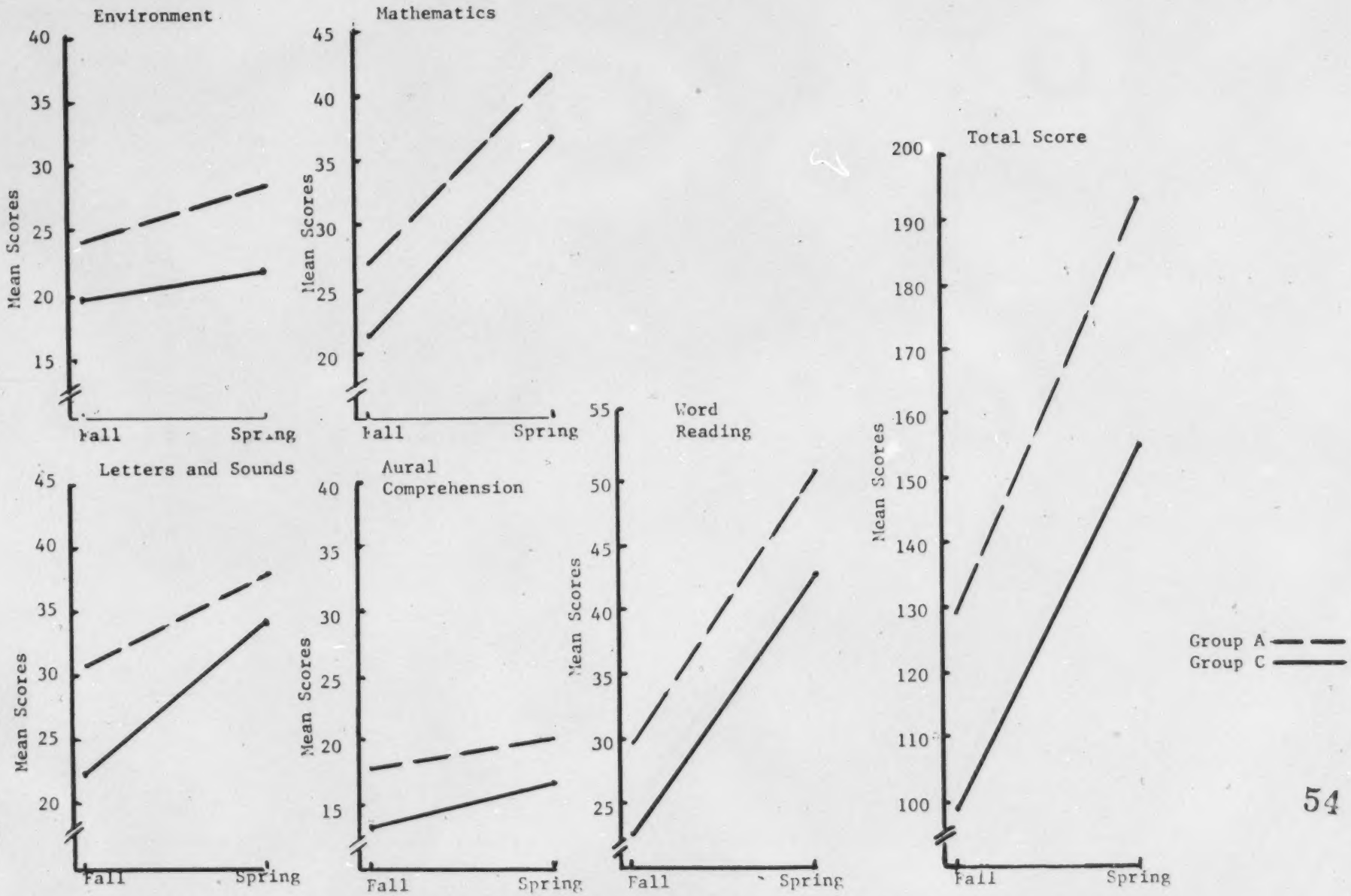

Figure 6: Changes in the mean Stanford Early Achievement Level II scores of Groups A and C from fall to Spring in Grade I.

Table 13

Summary of Teacher Reports of school adjustment at the Grade 1 level

for 10 Group A PGs[1] and 18 controls

1. How well has this child adjusted to your class?

PGs	50.0	above average	50.0	average	0 below average
Controls	11.1	above average	72.2	average	16.7 below average

2. Are this child's attitudes toward school, teachers, and school work positive?

PGs	50.0	above average	40.0	average	10.0 below average
Controls	22.2	above average	77.8	average	0 below average

3. Was this child well prepared academically for your class?

PGs	40.0	above average	50.0	average	10.0 below average
Controls	5.6	above average	61.1	average	33.3 below average

4. How well has this child progressed academically during the current year?

PGs	50.0	above average	40.0	average	10.0 below average
Controls	17.6	above average	64.7	average	17.6 below average

5. Did this child need special remedial help?

PGs	100.0	No	0	Yes
Controls	50.0	No	50.0	Yes

6. Did this child attend school regularly?

PGs	100.0	Yes	0	No
Controls	88.9	Yes	11.1	No

7. Was this child promoted to the next grade?

PGs	100.0	Yes	0	No
Controls	72.2	Yes	27.8	No

8. What is your general appraisal of this child's personal and social competence?

PGs	80.0	good	20.0	some concern	0	poor
Controls	50.0	good	33.3	some concern	16.7	poor

9. What is your general appraisal of this child's academic competence?

PGs	60.0	above average	40.0	average	0	below average
Controls	5.5	above average	66.7	average	27.8	below average

Notes

1. There were 12 Group A PGs at this level but teacher reports were not submitted on two of them. However, it is known that, although one subject received remedial help, both were promoted to Grade 2 (questions 5 and 7).
2. All figures are percentages.

their attitudes (positive) toward school, teachers, and school work (question 2). The personal-social adjustment of the Group A subjects was judged to be "good" for 80% of the sample and "poor" for none, but to be "good" for only 50% of the control sample and "poor" for 16.7% (question 8).

The academic competence of 60% of the PGs in Group A was judged to be above average and none was considered below average (question 9). In contrast, only 5.5% of the controls were considered above average and 27.8% were judged to be below average. One of the PGs was given some special academic assistance, but 50% of the controls received such help (question 5). Finally, all of the PGs were promoted, but 27.8% of the controls "failed" and were not promoted to Grade 2 (question 7).

Behavior Rating Scale

Mean teacher ratings of the school behavior of the subjects at the Grade 1 level are presented in Table 14.

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Insert Table 14 about here
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As was the case at the Kindergarten level the differences between the groups as assessed by this measure were small. This was surprising here, because it was not consistent with the teacher descriptions of the subjects in the school adjustment reports.

Kansas Reflection-Impulsivitiy Scale (KRISP)

The classifications of the subjects, based on their performance on this test, are presented by group and testing time in Table 15.

- - - - - - - - - - - - - - -
Insert Table 15 about here
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In the spring, though not in the fall, a somewhat larger proportion of the PGs than the controls performed satisfactorily on this test (i.e., were

Table 14

Mean and (SD) Behavior Rating Scale scores for groups A and C at the end of Grade 1

Dimension	Group A (n=10)	Group C (n=18)
Aggression	11.8 (3.2)	13.7 (3.1)
Verbal-Social Interaction	13.7 (2.3)	11.7 (3.0)
Timidity	13.3 (2.8)	12.5 (3.2)
Independence	11.9 (3.6)	11.3 (3.4)
Achievement Motivation	11.6 (3.8)	12.3 (3.3)
Impatience	12.1 (3.1)	11.4 (3.0)
External Reliance	14.0 (2.8)	11.9 (4.2)
Inattentive-Withdrawn	12.2 (4.2)	13.0 (3.7)
Creative-Initiative	11.1 (3.2)	8.6 (3.9)
Need for Closeness	12.6 (2.4)	11.9 (2.9)

Note

For Aggression, Timidity, Impatience, External Reliance, Inattentive-Withdrawn, higher scores indicate less of the behavior.

Table 15

Number of subjects in each KRISP category by group and testing time at the Grade 1 level

	Group A		Group B		Group C	
	n=12 Fall	n=11 Spring	n=2 Fall	n=2 Spring	n=18 Fall	n=17 Spring
Slow-Accurate						
Very Reflective	2	0	0	0	0	3
Reflective	1	2	0	2	3	4
Average	1	1	1	0	7	3
Fast-Accurate	6	8	0	0	4	5
Fast-Inaccurate						
Very Impulsive	2	0	0	0	2	0
Impulsive	0	0	1	0	2	2
Slow-Inaccurate	0	0	0	0	0	0

very reflective, reflective, average or fast-accurate). The percentage of subjects in these categories (combined), in groups A, B and C respectively, was 83.3, 50.0, 77.7 (fall) and 100, 100 and 88.2 (spring).

Summary of Results, Grade 1 Level

Intelligence and Cognition. These findings indicate that the IQ gains made by the PGs in preschool were maintained at the Grade 1 level and their mean score continued to increase slightly. Also, as measured by the Circus tests, their cognitive competence was maintained or improved during the year. In the spring their performance was above average in Classification and Numerical Concepts and superior in Mathematical Concepts and Conservation.

In contrast, the mean IQ of the controls increased by one point but their performance on the Circus tests was below average on every measure except the Language test ("Say and Tell").

In general, there was no evidence suggesting that the control subjects were "catching up" to the PGs or that the level of performance of the PGs was deteriorating.

Academic Achievement. The performance of the PGs was average or better than average (as judged against U.S. norms) in all areas except Mathematics in both the fall and the spring, but the performance of the controls was below average in all areas at both testing times. Also, there was no narrowing of the gap between the two groups suggesting that the controls were not "catching up". The below average achievement of the PGs on Mathematics was not consistent with their superior performance on the "How Much and How Many" Circus test. Thus, the level of achievement obtained in this area may have been a reflection of how much Mathematics was taught (in the London schools as compared with U.S. schools) rather than the subjects' ability to learn Mathematics.

Further evidence that the PGs were performing better, academically, than the controls was that only one of them received any remedial training (as compared to 50% of the controls who did) and all of them were promoted (as compared to 27.8% of the controls who were not). Also, the teachers judged the academic competence of the PGs to be in every case average or above average.

Social Behavior and Personal-Social Adjustment. In general, the teachers judged the PGs to be superior to the controls in their social adjustment and attitudes toward school and school work.

Grade 2 Results

At this level, data have been accumulated on only 15 subjects: nine PGs (seven in Group A and two in Group B) and six controls. All were in Grade 2 except one control subject who was repeating Grade 1. In mid-year one of the controls moved out of the city and was lost. The findings with these small samples are reported but they must be regarded as inconclusive.

Binet IQ

At the beginning of Grade 2 the mean IQs of the two PG groups were 105.3 (Group A) and 102.5 (Group B). These scores compare favourably with the mean IQs of these particular small samples of subjects at the end of their preschool year(s) which were 106.6 (Group A) and 101.5 (Group B). Thus, these children were clearly maintaining their preschool IQ gains. The mean IQ of the six control subjects was 94.2, slightly lower than the mean of 96.7 attained by them at the end of Kindergarten.

Stanford Early School Achievement

The data on this measure for only groups A and C are reported, because they were available for only one of the Group B subjects. Mean scores on the Primary

I battery, which was administered in the fall, and on the Primary II battery, which was administered in the spring are presented separately in Tables 16 and 17 respectively because scores on these two batteries are not comparable.

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Insert Tables 16 and 17 about here

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At the beginning of Grade 2 the PGs (Group A) were achieving at an average or above average level (as judged by U.S. norms) in all areas assessed except Spelling and were excelling in Word Study Skills and Arithmetic (at the 92 and 96 percentile levels respectively). However, in the spring their achievement appeared to be below average in all areas except Word Study Skills and Language. However, here again the use of U.S. norms for judging the academic achievement of children in Canadian schools is questionable. In this regard it is noteworthy that in the fall the performance of the control subjects was also above average in the areas in which the PGs were excelling. Their achievements on Word Study Skills and Arithmetic were at the 80 and 89 percentile levels respectively. This suggests that, in the London schools, the skills measured by these two tests were emphasized in the Grade 1 and early Grade 2 curricula.

Although it is difficult to judge with this measure how well the PGs were maintaining their achievement levels throughout this grade, it is clear that they were continuing to achieve at levels higher than the controls in all of the academic areas assessed.

Teacher Reports of School Adjustment and Performance

The teachers' responses to the open-ended questionnaire for the subjects in Grade 2 are summarized in Table 18.

Table 16

Mean and (SD) Stanford Early School Achievement Primary I Battery test scores for groups A and C at the beginning of Grade 2

Subtest	Group A (n=7)	Group C (n=5)
Word Reading	24.3 (7.5)	14.8 (5.7)
Paragraph Meaning	23.3 (12.7)	6.4 (7.0)
Vocabulary	23.7 (4.8)	18.6 (1.5)
Spelling	10.0 (5.3)	4.4 (4.1)
Word Study Skills	39.9 (8.5)	28.0 (9.6)
Arithmetic	35.7 (14.0)	29.2 (13.1)

Note

Range of scores in Stanine 5 (average performance based on U.S. norms)

Word Reading	20-22
Paragraph Meaning	20-22
Vocabulary	20-22
Spelling	20-22
Word Study Skills	20-22
Arithmetic	20-22

Table 17

Mean and (SD) Stanford Early School Achievement Primary II Battery test scores for groups A and C at the end of Grade 2

Subtest	Group A (n=7)	Group C (n=4)
Word Reading	16.6 (5.9)	7.5 (3.5)
Paragraph Meaning	23.9 (11.8)	9.8 (8.4)
Science & Social Studies	15.7 (2.2)	13.0 (3.6)
Spelling	10.0 (2.6)	6.3 (5.2)
Word Study Skills	36.0 (14.2)	20.5 (14.8)
Language	33.6 (10.2)	26.5 (7.8)
Arithmetic Computation	18.7 (9.8)	10.8 (4.4)
Arithmetic Concepts	10.0 (3.7)	6.3 (2.6)

Note

Range of scores in Stanine 5 (average performance based on U.S. norms)

Word Reading	28-30
Paragraph Meaning	27-30
Science & Social Studies	27-31
Spelling	26-31
Word Study Skills	27-33
Language	27-30
Arithmetic Computation	28-30
Arithmetic Concepts	27-31

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Insert Table 18 about here

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More of the PGs than the controls were said to be adjusting well to school (question 1) and to have positive attitudes toward school, teachers, and school work (question 2). Also, the academic competence of one third of the PGs (as compared to none of the controls) was judged to be above average (question 9). However, two of the seven PGs received some special academic help at this level (one in Mathematics and one in Reading), but two of the four control subjects also received such help (one in Reading and one in Language). All seven of the PGs, but only three of the four controls, completed their year successfully and were promoted to Grade 3 (question 7). The personal-social adjustment of the PGs was also rated higher than the controls (question 8).

Behavior Rating Scale

Mean teacher ratings of the classroom behavior of the groups in Grade 2 are presented in Table 19.

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Insert Table 19 about here

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Again, as at the earlier grade levels, this measure did not differentiate the groups, a finding which was not consistent with the responses of the teachers to the open-ended questionnaire.

Matching Familiar Figures Test (MFF)

The data obtained with this measure can not be interpreted with such a small sample and are therefore not reported at this time.

Table 18

Summary of Teacher Reports of adjustment and performance in Grade 2

1. How well has this child adjusted to your class?

PGs	50.0	above average	33.3	average	16.7 below average
Controls	0	above average	66.7	average	33.3 below average

2. Are this child's attitudes toward school, teachers, and school work positive?

PGs	33.3	above average	66.7	average	0 below average
Controls	25.0	above average	50.0	average	25.0 below average

3. Was this child well prepared academically for your class?

PGs	16.7	above average	66.7	average	16.7 below average
Controls	0	above average	50.0	average	50.0 below average

4. How well has this child progressed academically during the current year?

PGs	16.7	above average	83.3	average	0 below average
Controls	0	above average	75.0	average	25.0 below average

5. Did this child need special remedial help?

PGs	33.3	Yes	66.7	No
Controls	50.0	Yes	50.0	No

6. Did this child attend school regularly?

PGs	83.3	Yes	16.7	No
Controls	100.0	Yes	0	No

7. Was this child promoted to the next grade?

PGs	100.0	Yes	0	No
Controls	75.0	Yes	25.0	No

8. What is your general appraisal of this child's personal and social competence?

PGs	66.7	good	33.3	some concern	0	poor
Controls	50.0	good	25.0	some concern	25.0	poor

9. What is your general appraisal of this child's academic competence?

PGs	33.3	above average	66.7	average	0	below average
Controls	0	above average	75.0	average	25.0	average

Notes

1. There were seven Group A subjects at this level but no teacher report was obtained for one of them. However, it is known that this subject required no remedial help and passed to Grade 3.
2. Attrition: PGs (n=6) one subject of the original group of eight was lost at the end of Grade 1
   Controls (n=4) one subject of the original group of six was lost in the middle of Grade 2. The other subject was not included because she was repeating Grade 1

Table 19

Mean and (SD) Behavior Rating Scale scores for groups A and C at the end of Grade 2

Dimension	Group A (n=6)	Group C (n=5)*
1. Aggression	13.7 (2.3)	13.0 (3.7)
2. Verbal-Social Interaction	12.2 (3.3)	13.0 (3.4)
3. Timidity	12.2 (3.6)	12.6 (3.2)
4. Independence	10.5 (5.2)	11.4 (2.7)
5. Achievement Motivation	12.8 (2.9)	11.4 (1.7)
6. Impatience	13.0 (3.0)	13.4 (1.8)
7. External Reliance	13.0 (5.0)	12.2 (3.1)
8. Inattentive-Withdrawn	12.0 (3.8)	11.8 (2.9)
9. Creative-Initiative	11.2 (4.2)	12.2 (2.9)
10. Need for Closeness	11.5 (3.3)	12.8 (3.8)

Note

For Aggression, Timidity, Impatience, External Reliance, Inattentive-Withdrawn, higher scores indicate less of the behavior.

*Group C (n=5) includes the subject repeating Grade 1

Summary of Results, Grade 2 Level

The PGs at this level continued to maintain their preschool IQ gains. Although their Stanford Achievement scores were below average in some areas in the spring, they were higher than those of the controls. All of the PGs were judged by their teachers to be average or above average in academic competence (although two of them received some extra instruction) but none of the controls was considered above average and one was judged to be below average and two received extra instruction. All nine of the PGs passed their year successfully and were promoted to Grade 3 but one of the four controls failed and only three were promoted.

DISCUSSION

In general, these findings are encouraging. The PGs, even those at the second grade level, have maintained their preschool IQ gains. As a group they have done acceptable or above average academic work and no PG has been required to repeat a grade. In contrast, the academic achievement of the control group has been, more often than not, below average and six of the controls have been required to repeat a grade.

As was expected, at the Kindergarten level, Group C made somewhat greater gains than Group A on all of the tests and greater gains than Group B on three of them. However, these gains were not as great as those made by the PG groups in preschool, and the control group did not "catch up".

By the end of Grade 1 the Language abilities of the control subjects had improved and, although their scores were still below those of the PGs, in Functional Language and Narration they were performing at an average or above average level. At this time the PGs were clearly performing at a cognitive

level which was higher than the controls, as evidenced by their higher scores on Classification, Mathematical Concepts, and Conservation. This finding is of particular interest since the compensatory program offered them in preschool focused on the activation of the processes which are thought to underlie the development of logical thought. The academic area in which the PGs were making greater progress than the controls was in Reading. This was apparent at both the Grade 1 and the Grade 2 levels.

Perhaps it is premature to draw any conclusions about the effects of age at entry into preschool or school because the size of the Group B sample is still so small. However, the children who started preschool as three-year-olds appear to have made greater initial IQ and other types of cognitive gains than those who started preschool as four-year-olds or Kindergarten as five-year-olds and so far these gains have been maintained.

Finally, the personal-social adjustment of the PGs in the public schools has been, in general, satisfactory and somewhat superior to the controls, although the behavior of the PGs with only one year of preschool experience has been less acceptable than the behavior of those with two years of preschool.

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APPENDIX A(i)

Age, sex, Preschool Inventory Percentile Score and Binet IQ of each child when he/she became a subject in the project by group

GROUP A					GROUP B					GROUP C				
Subject #	CA	Sex	PI	IQ	Subject #	CA	Sex	PI	IQ	Subject #	CA	Sex	PI	IQ
1	3-0	F	3	(84)	10	4-0	M	88	(110)	201	5-6	F	11	92
2	3-2	F	0	(77)	44	4-0	M	12	78	202	5-9	F	76	93
3	3-3	F	3	(102)	102	4-8	M	60	99	203	4-11	F	89	103
4	3-0	M	3	(88)	104	4-7	F	79	102	204	4-10	M	76	92
6	3-1	F	17	(104)	105	4-9	M	95	104	205	4-11	M	82	94
7	3-6	F	56	(108)	106	4-1	F	91	106	207	5-5	F	25	77
8	3-8	F	13	(97)	107	3-10	F	1	71	210	5-4	M	18	60
9	3-0	M	10	(102)	120	4-0	M	23	82	211	5-6	F	82	95
42	3-2	M	7	91	122	4-6	M	69	89	212	5-0	M	75	90
43	3-8	M	73	90	123	4-7	F	71	104	213	5-4	F	82	86
46	3-7	M	37	85	124	4-1	M	62	92	214	5-6	M	55	95
47	3-0	F	0	77	125	4-2	F	81	98	215	5-3	M	63	72
70	3-3	M	6	82						216	5-0	M	48	94
72	3-8	M	59	96						217	5-3	M	82	100
73	3-3	M	8	77						218	5-2	F	72	96
74	3-2	F	13	88						219	5-2	F	72	104
75	3-6	F	97	105						220	5-3	F	69	103
76	3-3	M	7	100						221	5-3	F	66	71
77	3-7	M	10	83						230	4-11	M	91	103
78	3-9	M	25	90						231	4-11	F	25	91
79	3-3	F	0	75						232	5-5	F	43	98
80	3-2	F	53	112						233	5-0	F	48	81
81	3-3	F	1	68						234	5-6	F	32	95
82	3-0	F	0	79						235	5-5	F	41	90

Notes

1. CA: Age when child was first tested (mid-October) is shown by years and months (i.e., 3-6 = 3 years and 6 months).
2. Binet IQ: The scores in brackets were obtained in the fall, following the subject's first year in preschool (the Binet was not included in the test battery in the first year of the preschool project).
3. Summary Table: the above data are summarized in Appendix A(ii).

APPENDIX A(ii)

Description of Groups - Summary Table

Description of the groups by sex and mean age Preschool Inventory, Percentile score and IQ at entrance into the project

	Group A (n=24)	Group B (n=12)	Group C (n=24)
Chronological Age			
Mean (in months)	39.6 (2.9)	51.3 (3.8)	62.8 (3.0)
Range	3-0 to 3-9	3-10 to 4-9	4-10 to 5-9
Sex			
Males	11	7	9
Females	13	5	15
Preschool Inventory Percentile			
Mean	20.9	61.0	59.3
SD	26.9	31.8	24.0
Range	0 to 97	1 to 95	11 to 91
Binet IQ*			
Mean	87.4	93.2	90.6
SD	11.7	11.8	11.0
Range	68 to 112	71 to 106	60 to 104

*IQ data do not include scores obtained <u>after</u> a child's first preschool year (shown in brackets on preceding page). The n's were as follows: 16 (Group A), 11 (Group B), 24 (Group C).

APPENDIX B U.W.O. -- Wright

School Adjustment Report

Child's Name _____ Teacher _____

School _____ Date _____

PLEASE COMMENT ON THE FOLLOWING:

1. How well has this child adjusted to your class? Please check in the appropriate box and then comment.

   below average ☐ average ☐ above average ☐

2. Are this child's attitudes toward school, teachers and school work positive? Please check in the appropriate box and then comment.

   below average ☐ average ☐ above average ☐

3. Was the child well prepared academically for the work of your class? Please check in the appropriate box and then comment indicating strengths and weaknesses.

   below average ☐ average ☐ above average ☐

4. Did this child need special remedial treatment or special help of any kind during this academic year? Yes ☐ No ☐

   If yes, please describe:

5. How well has this child progressed academically during the current year? Please check and comment on changes in performance over the year.

   below average ☐ average ☐ above average ☐

6. Will the child be promoted to the next grade? Yes ☐ No ☐

   If no, please explain why:

7. Has this child attended school regularly? Yes ☐ No ☐

   If no, please explain:

8. What is your general appraisal of this child's personal and social competence?

9. What is your general appraisal of this child's academic competence?

10. Please provide any additional descriptions of this child's behavior which are particularly striking or characteristic, or any other relevant information.